

Applicant : J. Stuart Cumming
Appl. No. : 09/943,910
Examiner : Christopher D. Prone
Docket No. : 13533.4030

Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

1. (withdrawn) An intraocular lens for implanting within a natural capsular bag of a human eye, said lens implant comprising:

a lens body having anterior and posterior sides and including an optic and two or more plate haptics spaced about said optic, said haptics having inner ends adjacent to said optic and outer ends extending from said optic, said haptics having lateral edges; and

at least one of said haptics having one or more notches spaced about said lateral edges of said haptics and at least one of said haptics having a thinner portion adjacent the optic.

2. (withdrawn) A lens according to claim 1, wherein said notches have an edge portion.

Claims 3-4 (cancelled)

5. (withdrawn) A lens according to claim 2, wherein:
said edge portion being disposed substantially transversally to a longitudinal axis of said haptic.

6. (withdrawn) A lens according to claim 2, wherein:
said edge portion being disposed substantially transversally to a side edge of said haptic.

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7. (withdrawn) A lens according to claim 1, further comprising:
a plurality of protuberances extending outwardly from at least one of the anterior and/or posterior sides of one or more of said haptics to fixate said haptic in a natural capsular bag of an eye.

8. (withdrawn) A lens according to claim 1, wherein:
at least one of said haptics has a plurality of openings formed therethrough to allow fibrosis of an anterior capsule remnant to a posterior capsule remnant through said haptic outer end opening following implantation of said lens into a natural capsular bag of an eye.

9. (currently amended) A flexible accommodating intraocular lens designed for implanting within a natural capsular bag of a human eye, said lens implant comprising:

a single solid optic having anterior and posterior sides and two or more separate plate haptics extending from two or more parts of the peripheral edge of said optic, each haptic being separated from another haptic by part of the circumference of the optic,

said haptics being thinner than their width, ~~having narrow edges and wider~~ ~~anterior and posterior sides~~ their inner ends adjacent to said optic and outer ends extending from said optic designed to directly engage the interior of the capsular bag, each at least one haptic having a narrow groove adjacent and tangential to the optic extending transversely across the plate haptics from one edge to the other thereby reducing their thickness,

said haptics being adapted to move said optic anteriorly toward the iris and posteriorly relative to the outer ends of said haptics upon constriction and relaxation of the ciliary muscle of the eye, and

said haptics having at least one fixation protuberance extending from either anteriorly or posteriorly or from both surfaces of at least one of said haptics designed to directly engage the inside of the capsular bag.

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10. (previously amended) The lens according to claim 9, wherein at least one protuberance extends anteriorly from said haptics.

11. (previously amended) The lens according to claim 9, wherein at least one protuberance extends posteriorly from said haptics.

12. (previously amended) The lens according to claim 9, wherein at least one protuberance extends both anteriorly and posteriorly from said haptics.

13. (previously amended) The lens according to claim 9, wherein at least one protuberance extends laterally from said haptics.

14. (cancelled)

15. (cancelled)

16. (withdrawn) The lens according to claim 9, wherein said haptics have lateral edges, and
at least one of said haptics have one or more notches spaced about said lateral edges of said haptics.

17. (previously amended) The lens according to claim 9, wherein lateral edges of said haptics are parallel to each other, or tapered outwardly from the optic, or tapered inwardly from the optic.

18. (withdrawn) The lens according to claim 9, wherein said haptics have one or more openings formed therethrough.

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19. (withdrawn) The lens according to claim 9, wherein the protuberances are prong portions with globular knob end portions.

20. (withdrawn) The lens according to claim 9, wherein the protuberances are prong protuberances.

21. (previously presented) The lens according to claim 9, wherein the protuberances extend outwardly from the anterior and/or posterior sides.

22. (previously presented) The lens according to claim 9, wherein the protuberances extend outwardly from the peripheral border of said haptic.

23. (withdrawn) An intraocular lens for implanting within a natural capsular bag of a human eye, said lens implant comprising:

a lens body having anterior and posterior sides and including an optic and two or more plate haptics spaced about said optic, said haptics having inner ends adjacent to said optic and outer ends extending from said optic, said haptics having lateral edges; and

at least one of said haptics having one or more notches with an edge portion and the notches being spaced about said lateral edges of said haptics, said edge portion being disposed at a substantial angle to a longitudinal axis of said haptic.

24. (withdrawn) An intraocular lens for implanting within a natural capsular bag of a human eye, said lens implant comprising:

a lens body having anterior and posterior sides and including an optic and two or more plate haptics spaced about said optic, said haptics having inner ends adjacent to said optic and outer ends extending from said optic, said haptics having lateral edges; and

at least one of said haptics having one or more notches with an edge portion and

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the notches being spaced about said lateral edges of said haptics, said edge portion being disposed at a substantial angle to a side edge of said haptic.

25. (currently amended) A flexible accommodating intraocular lens designed for implanting within a natural capsular bag of a human eye, said lens implant comprising:

a single solid optic having anterior and posterior sides two or more separate plate haptics extending from two or more parts of the peripheral edge of said optic and each haptic being separated from another haptic by part of the circumference of the optic,

said haptics being thinner than their width, ~~having narrow edges and wider anterior and posterior sides,~~ their inner ends adjacent to said optic and outer ends extending from said optic designed to directly engage the interior of the capsular bag, the inner ends having a narrow groove adjacent and tangential to the optic extending transversely across the plate haptics from one edge to the other thereby reducing their thickness,

said haptics being adapted to move said optic anteriorly toward the iris and posteriorly relative to the outer ends of said haptics upon construction and relaxation of the ciliary muscle of the eye, and

said haptics having fixation protuberances extending both anteriorly and posteriorly from said haptic designed to directly engage the inside of the capsular bag.

26. (previously presented) The lens according to Claim 25, wherein said haptics comprise at least a pair of haptics both having protuberances extending both anteriorly and posteriorly therefrom.

27. (previously presented) The lens according to Claim 26, wherein said haptics are plate haptics and each have a thinner portion adjacent the optic.

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28. (withdrawn) The lens according to Claim 9 wherein at least one of said haptics has one or more notches with an edge portion and the notches being spaced about said lateral edges of said haptics, said edge portions being disposed at a substantial angle to a longitudinal axis of said haptic.

29. (withdrawn) The lens according to Claim 25 wherein at least one of said haptics has one or more notches with an edge portion and the notches being spaced about said lateral edges of said haptics, said edge portions being disposed at a substantial angle to a longitudinal axis of said haptic.

30. (currently amended) A flexible accommodating intraocular lens including a flexible optic designed to be placed within the capsular bag of the eye,

the lens comprising a single solid optic with anterior and posterior sides and two or more plate haptics extending ~~portions~~ from the optic designed to directly engage the interior of the capsular bag, the inner ends having narrow grooves adjacent and tangential to the optic extending transversely across the plate haptics from one edge to the other thereby reducing their thickness,

the haptics being thinner than their width, and ~~extending portions~~ having at their distal ends fixation devices such that the intraocular lens has four or more fixation points for centration and fixation directly in the periphery of the capsular bag, and

the lens being adapted to move anteriorly toward the iris upon ciliary muscle constriction.

31. (previously presented) An accommodating intraocular lens according to Claim 30 wherein the extending portions comprise haptics.

32. (previously presented) An accommodating intraocular lens according to Claim 30 wherein the fixation points comprise protuberances.

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33. (previously presented) An accommodating intraocular lens according to Claim 32 wherein the protuberances extend anteriorly and posteriorly.

34. (currently amended) A flexible accommodating intraocular lens designed for implanting within a natural capsular bag of a human eye, said lens implant comprising:

a single optic having anterior and posterior sides and two or more separate plate haptics extending from the edge of said optic, each haptic being separated from another haptic by part of the circumference of the optic,

said haptics being thinner than their width, and ~~having narrow edges and wider anterior and posterior sides,~~ their inner ends adjacent to said optic and outer ends extending from said optic designed to engage the interior of the capsular bag, each at least one haptic having a narrow groove adjacent and tangential to the optic extending transversely across the plate haptics from one edge to the other thereby reducing the thickness,

said haptics being adapted to move said optic anteriorly toward the iris and posteriorly relative to the outer ends of said haptics upon constriction and relaxation of the ciliary muscle of the eye, and

said haptics having at least one fixation element extending from at least one surface of said haptic designed to engage the inside of the capsular bag.

35. (previously amended) The lens according to claim 34, wherein at least one fixation element extends anteriorly from said haptics.

36. (previously amended) The lens according to claim 34, wherein at least one fixation element extends posteriorly from said haptics.

37. (previously amended) The lens according to claim 34, wherein at least one fixation element extends both anteriorly and posteriorly from said haptics.

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38. (previously amended) The lens according to claim 34, wherein at least one fixation element extends laterally from said haptics.

39. (previously amended) The lens according to claim 34, wherein at least one fixation element extends anteriorly or posteriorly, or both anteriorly and posteriorly from said haptics, and may have at least one other fixation element that extends laterally from said haptics.

40. (previously presented) The lens according to claim 34, wherein said lateral edges of said haptics are parallel to each other, or tapered outwardly from the optic, or tapered inwardly from the optic.

41. (previously presented) The lens according to claim 34, wherein the fixation elements extend outwardly from the anterior and/or posterior sides.

42. (currently amended) The lens according to claim 34, wherein the fixation elements extend outwardly from the peripheral border of said haptic.

43. (currently amended) A flexible accommodating intraocular lens designed for implanting within a natural capsular bag of a human eye, said lens implant comprising:

a single solid optic having anterior and posterior sides and two or more separate plate haptics extending from two or more parts of the peripheral edge of said optic, each haptic being separated from another haptic by part of the circumference of the optic,
said haptics being thinner than their width and having inner ends adjacent to said optic and outer ends extending from said optic designed to engage the interior of the capsular bag, the inner ends each having a narrow groove adjacent and tangential to the optic extending transversely across the plate haptics from one edge to the other,

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said haptics being adapted to move said optic anteriorly toward the iris and posteriorly relative to the outer ends of said haptics upon construction and relaxation of the ciliary muscle of the eye, and

said haptics having fixation elements extending both anteriorly and posteriorly from said haptic designed to engage the inside of the capsular bag.

44. (previously presented) The lens according to Claim 43, wherein said haptics comprise at least a pair of haptics both having a fixation element extending both anteriorly and posteriorly therefrom.

45. (previously presented) The lens according to Claim 44, wherein said haptics are plate haptics and each has a thinner portion adjacent the optic.

46. (currently amended) A flexible accommodating intraocular lens including a flexible solid optic to be placed within the capsular bag of the eye,

the lens comprising an optic with anterior and posterior sides and two or more extending portions from the optic designed to engage the capsular bag, the inner ends having a thinner portion adjacent and tangential to the optic extending transversely across the extending portions from one edge to the other, the extending portions being thinner than their width,

the extending portions having at their distal ends fixation elements such that the intraocular lens has four or more fixation elements for centration and fixation directly in the periphery of the capsular bag, and

the lens being adapted to move anteriorly toward the iris upon ciliary muscle construction.

47. (previously presented) An accommodating intraocular lens according to Claim 46 wherein the extending portions comprise haptics.

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48. (previously presented) An accommodating intraocular lens according to Claim 46 wherein the fixation elements comprise protuberances.

49. (previously presented) An accommodating intraocular lens according to Claim 48 wherein the fixation elements extend anteriorly and posteriorly.

50. (currently amended) A flexible accommodating intraocular lens designed for implanting within a natural capsular bag of a human eye, said lens implant comprising:

a single biconvex solid optic having anterior and posterior sides and two or more separate plate haptics extending from the edge of said optic, each haptic being separated from another haptic by part of the circumference of the optic,

said haptics being thinner than their width, ~~having narrow edges and wider anterior and posterior sides,~~ their inner ends adjacent to said optic and outer ends extending from said optic designed to engage the interior of the capsular bag, each haptic the haptics having a narrow groove adjacent and tangential to the optic extending transversely across the plate haptics from one edge to the other thereby reducing their thickness,

said haptics being adapted to move said optic anteriorly toward the iris and posteriorly relative to the outer ends of said haptics upon constriction and relaxation of the ciliary muscle of the eye, and

said haptics having at least one fixation element extending from at least one surface of each haptic designed to engage the inside of the capsular bag.

51. (previously amended) The lens according to claim 50, wherein at least one fixation element extends anteriorly from said haptics.

52. (previously amended) The lens according to claim 50, wherein at least one fixation element extends posteriorly from said haptics.

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53. (previously amended) The lens according to claim 50, wherein at least one fixation element extends both anteriorly and posteriorly from said haptics.

54. (previously amended) The lens according to claim 50, wherein at least one fixation element extends laterally from said haptics.

55. (previously amended) The lens according to claim 50, wherein at least one fixation element extends anteriorly or posteriorly, or both anteriorly and posteriorly from said haptics, and may have at least one other fixation element that extends laterally from said haptics.

56. (previously presented) The lens according to claim 55, wherein said haptics have lateral edges, and
at least one of said haptics has one or more notches spaced about said lateral edges of said haptics.

57. (previously presented) The lens according to claim 55, wherein said lateral edges of the haptics are parallel to each other, or tapered outwardly from the optic, or tapered inwardly from the optic.

58. (previously presented) The lens according to claim 55, wherein said haptics have one or more openings formed therethrough.

59. (previously presented) The lens according to claim 55, wherein the fixation elements have knob end portions.

60. (currently amended) A flexible accommodating intraocular lens designed for implanting within a natural capsular bag of a human eye, said lens implant comprising:

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a single solid optic having anterior and posterior sides and two or more separate plate haptics extending from two or more parts of the peripheral edge of said optic, each haptic being separated from another haptic by part of the circumference of the optic,

said haptics being thinner than their width, ~~having narrow edges and wider anterior and posterior sides,~~ their inner ends adjacent to said optic and outer ends extending from said optic designed to engage the interior of the capsular bag, the inner ends having a narrow groove adjacent and tangential to the optic extending transversely across the plate haptics from one edge to the other thereby reducing their thickness,

said haptics being adapted to move said optic anteriorly toward the iris and posteriorly relative to the outer ends of said haptics upon construction and relaxation of the ciliary muscle of the eye, and

each of said haptics having fixation elements extending anteriorly and or posteriorly from said haptics and designed to engage the inside of the capsular bag.